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Do outdoor recreation participants place their lands in conservation easements?

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Abstract

It has been posited that participation in outdoor recreation activities increases awareness of environmental issues and support for environmental conservation. Studies have shown that different outdoor recreationists may have different environmental orientations. For example, because of their utility orientation toward land, consumptive recreationists may be less likely than non-consumptive recreationists to protect their land from development. Hence, using a United States household survey, this paper examines whether people participating in consumptive outdoor recreation activities differ from those who participate in non-consumptive recreation in their willingness to place their lands into conservation easements. Results indicate people who participate in land-based consumptive recreation are less likely to place their lands in conservation easements than people who participate in land-based non-consumptive recreation.

Keywords

Conservation easement, environmental concerns or awareness, natural resources, open space, outdoor recreation participation

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Introduction

It has been posited that participation in outdoor recreation activities increases awareness of environmental issues, enhances pro-environmental attitudes, and increases likelihood of supporting environmental conservation (Tarrant and Green 1999; Theodori et al. 1998). However, empirical findings concerning this issue are mixed and inconclusive. While the relationship between outdoor recreation participation and environmental attitudes or behavior has been shown to exist in regard to local environmental issues, such as concern for local forests or other natural resources, evidence of this relationship weakens when the environmental issues are broad scale, such as environmental pollution (Porter and Bright 2003).

Outdoor recreationists can interact with natural settings in a variety of ways as they engage in recreation activities. For example, bird watchers may seek out quiet, undisturbed places, while off-highway riders may seek the opposite. It is thus reasonable to expect some differences among recreationists in terms of their interactions with and attitudes toward natural settings. Because of goal differences, one might expect participants in consumptive recreation (e.g., hunting or fishing) to differ from non-consumptive recreation participants (e.g., wildlife watchers or hikers) in regards to their environmental orientations (Dunlap and Heffernan 1975; Jackson 1986). However, research on environmental behaviors of outdoor recreationists has not adequately explored whether participants who choose different recreation activities have different interests and ways of engaging in environmental protective activities. An example of such an activity is for a person to place their land into a conservation easement. A conservation easement is a voluntary and legal agreement between a landowner and an easement holder to protect its conservation values. Participating into an easement agreement may also give financial benefits to the landowners (e.g., federal tax benefits of qualified donations in the United States).

Some studies have shown that consumptive recreationists are more utility oriented (Dunlap and Heffernan 1975; Theodori et al. 1998), and, hence, place less emphasis on the public good aspect of land conservation easements. To shed more light on the relationship between outdoor recreation participation and environmental orientations, this study analyzed data from a United States household survey in which respondents were asked about their outdoor recreation activities and whether they own any category of land (e.g., agricultural land, forestland, wetland, or other open space) and, if so, whether they have placed their lands under a conservation easement.

Examining the relationship between recreation participation and willingness to place land into a conservation easement is relevant for various reasons. Availability of places for outdoor recreation, such as public parks and open space has a significant role in helping people remain physically active and healthy (Physical Activity Council 2013). However, because of urbanization and population growth, demand for places for outdoor recreation is increasing, while the supply is relatively restricted in scope. One solution to this demand-supply imbalance is to increase open space through conservation easements on private land. In this regard, findings of this study could be useful in efforts to expand land area under such easements and also to help increase open space for outdoor recreation.

Outdoor recreation participation and environmental behaviors

Participation in outdoor recreation seems to be associated with people's pro-environmental attitudes. For instance, literature provides three arguments for this association. First, participation in outdoor recreation increases direct experiences with the natural environment and can also increase participants' attachment to areas where they recreate. Increased contact and attachment may help people become more aware of the values of nature, of associated environmental issues, and provide them with greater inspiration to conserve the environment (Porter and Bright 2003; Thapa and Graefe 2003). Direct contact may also help shape people's environmental attitudes or behaviors because personal experience often leads to greater understanding and appreciation of natural resources (Tarrant and Green 1999). Second, outdoor recreation participation can offer learning opportunities that are likely to influence recreationists' environmental attitudes or behaviors (Thapa 2000). Examples of such opportunities may include interpretative messages and information on kiosks in areas where people recreate. This information can help recreationists become more familiar with local environmental issues. Finally, outdoor recreation participation can be thought of as a pathway to and a marker of sub-cultural membership. For instance, outdoor recreationists can be recruited for involvement with conservation organizations through membership and other forms of support (Teisl and O'Brien 2003).

It has been argued that choice of and participation in different recreation activities are influenced by individuals' environmental values or attitudes (Bjerke et al. 2006; Jackson 1986). People participating in different types of outdoor recreation may have different value orientations toward or concerning environmental conservation (Peterson et al. 2008; Theodori et al. 1998). One distinction between types of outdoor recreation is consumptive versus non-consumptive activities. Consumptive activities typically involve a mode of participation in which participants physically take something directly from the recreation setting. Consumptive activities are often seen as having a 'utilitarian' orientation. In contrast, non-consumptive activities are those in which enjoyment of the natural environment is often accomplished without removing anything (Dunlap and Heffernan 1975). However, depending on which consumptive or non-consumptive activities are being considered, both types of activities can alter by varying degrees the natural condition of the setting.

According to Vaske et al. (1982), there are two important goal oriented differences between participation in consumptive versus non-consumptive activities. First, consumptive activities are dominated by one clear, specific, and observable goal, which is, acquisition or harvesting of the natural product of interest. For instance, hunters seek to harvest game, and fishers want to catch fish. In contrast, the goals of non-consumptive recreationists are more general and less well-defined. Second, consumptive recreationists may have less control in achieving the defining goal of their activities than do non-consumptive recreationists. Backpackers or campers, for instance, may be motivated to experience nature, test their skills, experience solitude, and/or to be with friends. While these goals can be achieved throughout the entire experience, they do

not depend on acquiring a specific product, and are more easily substituted, if one goal is not satisfied. Some research has asserted that because consumptive recreationists extract resources from the environment, they have different environmental orientations than non-consumptive recreationists. This assertion has been examined and re-examined over decades, with mixed and inconclusive results.

Dunlap and Heffernan (1975) tested three hypotheses regarding outdoor recreation participation and environmental concern, which were: involvement in outdoor recreation is positively associated with environmental concern; involvement in non-consumptive outdoor recreation is more strongly associated with environmental concern than involvement in consumptive outdoor recreation; and the association between outdoor recreation involvement and protecting those aspects of the environment necessary for pursuing such activities is stronger than the association between outdoor recreation and other environmental issues, such as air and water pollution. However, Dunlap and Heffernan found weak support for their first hypothesis, modest support for their second hypothesis, and somewhat stronger support for their third hypothesis. In other words, the authors found non-consumptive recreationists expressed greater environmental concern than did consumptive recreationists. In subsequent studies, Pinhey and Grimes (1979) and Jackson (1986) also found support for Dunlap and Heffernan's hypotheses. In contrast, Geisler et al. (1977) and Van Liere and Noe (1981) found weak-to-no support for these hypotheses.

Because of these goal oriented differences, we *hypothesized* that consumptive recreationists have a different sensitivity to environmental issues, and, hence differ from non-consumptive recreationists in their support for and participation in conservation easement programs. Hence, building upon previous studies, we examined the hypothesis that consumptive recreationists are less likely to place their lands under easements, compared to their non-consumptive counterparts.

Determinants of conservation easements and pro-environmental attitudes or behaviors

Conservation easements are an important tool employed widely across the United States to protect ecological, historical, or scenic resources. Through this agreement, the landowners accept permanent restrictions on the way their property can be used. The easements provide landowners with a legal mean of protecting their properties' conservation values while retaining ownership, and being allowed certain complementary uses (Gustanski 2000). Easements may also yield financial benefits to landowners. For instance, the income tax benefits of qualified donations of lands or revenues from the sale of an easement have made the mechanism attractive for many landholders in the United States. The property protected may be any category of land, such as agricultural land, forestland, wetland, or natural open space. The easement agreement doesn't restrict landowners selling the lands or pass it onto heirs, but the property remains bound by the terms of the conservation easements.

Previous studies have analyzed factors affecting individuals' decisions to place their land in a conservation easement (e.g., Duke 2004, Johnston and Duke 2007; Lynch and Lovell 2003). These studies have found that area of landholding, distance from urban area, land value (opportunity costs of landholding), and agriculture returns to be important determinants of whether a piece of land is placed under an easement. Area of landholding has been shown to be positively associated with individuals' participation in conservation easements (Johnston and Duke 2007; Lynch and Lovell 2003). Individuals with more acreage may also donate some part of their lands for easements because of diminishing marginal utility of holding additional acreage. In considering purchasing of conservation rights, a land trust or local government unit may be attracted by a lower price per acre for large tracts (Lynch and Lovell 2003). Individuals with forests may also wish to participate in an easement agreement (e.g., forest easements) to protect their forestland from development.

Since undeveloped lands near a city, highway, or other developed areas have higher net returns from converting these lands through development, they are less likely to be placed under easements (Lynch and Lovell 2003). Similarly, lands with higher market value have greater opportunity costs to be considered before deciding whether or not to place them under easement (Cooper and Osborn 1998; Konyar and Osborn 1990). In contrast, higher returns from agricultural use increase the probability of placing lands under easements because the owner of a profitable farm might want to farm the land in the future and, thus, want to conserve it from development (Lynch and Lovell 2003). Besides economic values, some landholders may wish to preserve their lands due to non-consumptive values, such as a desire to preserve the land in a natural condition for one's heirs (Rilla and Sokolow 2000). Thus, years of land tenure and having a family member who may be interested in taking over stewardship of the land may increase the probability of participating in easements (Lynch and Lovell 2003).

Research on the relationship between outdoor recreation participation and placing land into a conservation easement is limited. However, some studies have examined the relationship between recreation participation and environmental attitudes or behaviors. Generally, it appears that participation in outdoor recreation is associated with pro-environmental attitudes. Hence, knowing a person's environmental attitudes may help understanding of how outdoor recreation participation may affect landowners' decisions to place their lands under conservation easements.

Individual socioeconomic and demographic characteristics, such as income, education, age, gender, and household size are also important determinants of environmental attitudes or behaviors (Gatersleben et al. 2002; Guerin et al. 2001). For instance, people with higher income tend to be more pro-environmental because they can bear the marginal increase in costs associated with supporting the environment (Straughan and Roberts 1999; Zimmer et al. 1994). Likewise, people with higher education better understand the consequences of environmental degradations and the need for conservation. Thus, people with higher education are more likely to be pro-environmentalists (Diamantopoulos et al. 2003).

Additionally, younger people are more likely to be sensitive to environmental issues and also be pro-environmental because they have grown up in a time in which environmental concerns have been a salient issue at some level (Straughan and Roberts 1999; Zimmer et al. 1994). Similarly, females are argued to be more pro-environmentalists than males due to their social development and gender role differences. For instance, females (more so than males) carefully consider the impacts of their actions on others (Stern et al. 1993; Straughan and Roberts 1999). Studies also posit that ethnic minorities are more concerned with environmental issues and are pro-environmentalists because they can be disproportionately victimized by environmental hazards (Brown 1995; Bullard 2000).

In summary, reviewed literature indicates that participation in outdoor recreation activities is associated with pro-environmental attitudes and that pro-environmental attitudes may motivate people to participate in environmental conservation programs, such as land conservation easements. Thus, this study aims to explore whether there is an extension of this relationship in that participation in different types of outdoor recreation is associated with participation in conservation easement programs.

Methods

Econometric model

We modeled the probability of placing lands under conservation easements (*CEs*) as a function of type of outdoor recreation activity participation (***R***). We identified two groups based on the types of recreation they participated in (i.e., consumptive or non-consumptive activities). Literature on recreation participation has shown some key differences in the determinants of demand for land-based consumptive activities, like hunting, and water-based activities, such as fishing (Floyd and Lee 2002). Accordingly, recreationists were further grouped based on whether their activities were land-based or water-based. A land-based consumptive recreation dummy was created with a value one to reflect participation in consumptive activities that were land-based, and zero otherwise. Similarly, a water-based consumptive recreation dummy was created and set equal to one if a respondent participated in consumptive activities that were water-based, and zero otherwise. Since both individual and community characteristics are important determinants of conservation easement participation and of environmental orientation, this study considered individual socioeconomic and demographic characteristics (***I***) to include gender (male/female), income, education, race (ethnic minorities), age, parcel of land owned (proxy for area of landholding), area of forest owned, years of land tenure, and family size; and community characteristics (***C***) to include gross returns per acre (proxy for land productivity), median housing value, residency location (urban/rural), and distance from major cities. Since difference in culture, topography, and land availability across the United States may lead to variation in outdoor recreation participation (Ghimire et al. 2014) and also variation in decisions

regarding placing lands into conservation easements, we controlled for geographic regions at a broad spatial level, using geographic region dummies (please visit http://www.fs.fed.us/research/rpa/regions.php to know more about the geographic classifications used in this analysis.). Hence, the probability of placing lands in conservation easements (*CEs*) may be summarized in a functional form as:

$$CEs = f(\boldsymbol{R}, \boldsymbol{I}, \boldsymbol{C}, \boldsymbol{G}) \quad (1)$$

Since the dependent variable (*CEs*) is binary (equals one if an individual had placed their land in a conservation easement, and zero otherwise), a probit model was used in preference over an ordinary least square (OLS) model for two reasons. First, probit regression ensures the probability range is between zero and one. In contrast, the OLS model does not ensure the probability estimate will be between zero and one. Second, since the dependent variable is binary, the constant variance (homoscedasticity) assumption of the OLS is violated, whereas the probit regression accommodates it (Wooldridge 2002).

Data

This study used outdoor recreation participation and private land ownership data from the National Survey on Recreation and the Environment (NSRE). The NSRE is a long-term data collection project of the United States Forest Service, Southern Research Station in collaboration with the University of Tennessee and is conducted regularly to see outdoor recreation participation trends across the United States. The NSRE is a random-digit-dialed telephone survey of individuals living in U.S. households. It employs a stratified random sample, based on urban/rural/near-urban geographic locations (Cordell et al. 2004). However, each version of the NSRE consists of different modules or sets of questions and was tested to ensure an average time of 15 minutes to complete. Approximately 5,000 people were surveyed in each version. Some over-sampling was done to ensure a minimum sample size of 500 per state (across all versions) or for some modules that focus on rural outdoor recreation use i.e., over-sampling of people living in rural areas. Both English and Spanish versions of the questionnaires were used and interviews were conducted bilingually to overcome language barriers (Cordell et al. 2004). The survey was conducted using a computer-aided telephone interviewing (CATI) system. The CATI system randomly selects a telephone number, the interviewer upon hearing someone answer inquires how many people in the household are 16 years or older. Of persons 16 or older, the one with the most recent birthday is selected for interviewing (Link and Oldendick 1998) (please visit http://warnell.forestry.uga.edu/nrrt/nsre/Nsre/nsre2.html to know more about the NSRE.).

The NSRE used in this study was conducted in 2005. The 2005 NSRE consisted of four modules or sets of questions related to outdoor recreation activity participation, constraints to participate in wilderness related activities, private land ownership, and

Table 1. Grouping outdoor recreation activities.

Groups	Outdoor recreation activities
Water-based	*Consumptive:* Freshwater fishing; fishing in cold water such as mountain rivers, lakes, or streams for trout; fishing in warm water rivers, lakes or streams for bass, bream, catfish, pike, crappie or perch; saltwater fishing; fishing for ocean-to-freshwater migratory fish such as salmon, shad, or steelhead trout.
	Non-consumptive: Sailing; canoeing; kayaking; rowing; motor-boating; waterskiing; boating using a personal watercraft such as jet skis or wave runners; rafting, tubing or any other type of floating on rivers or other flowing water; sailboarding or windsurfing; surfing; swimming, snorkeling, scuba diving or visit a beach or other waterside area; swimming in an outdoor pool; swimming in streams, lakes, ponds or the ocean; snorkeling; scuba diving; visit beaches for any outdoor recreation activities; visit a waterside other than a beach for recreation activities.
Land-based	*Consumptive*: Gather mushrooms, berries, firewood or other natural products; hunting – hunt big game, hunt small game, hunt waterfowl such as ducks or geese.
	Non-consumptive: Picnicking; gathering of family or friends in an outdoor area away from a home; visit an outdoor nature center, a nature trail, a visitor center or a zoo; visit prehistoric structures or archaeological sites; visit any historic sites, buildings or monuments; attend outdoor concerts, plays or other outdoor performances; attend outdoor sports events; walking for exercise or pleasure; day hiking; orienteering; visit a farm or other agricultural setting for recreation; camp at developed sites with facilities such as tables and toilets; camp at a primitive site without facilities; mountain climbing; rock climbing; caving; visit a wilderness or other primitive, road-less area; home gardening or landscaping for pleasure; view, identify or photograph birds; view, identify or photograph wildlife besides birds; view, identify or photograph salt or freshwater fish; view, identify or photograph wildflowers, trees or other natural vegetation; view or photograph natural scenery; sightseeing; driving for pleasure on country roads or in a park, forest or other natural setting; drive off-road for recreation using a 4-wheel drive, ATV or motorcycle.

migration. In the outdoor recreation participation module, people were asked about their participation in recreation activities over the last 12 months (NSRE 2005). In the sample, all respondents were found to participate in outdoor recreation activities at least once over the last 12 months (please see Table 1 for the lists of activities participated by respondents.). There were three types of respondents – those who only participated in consumptive activities, those who only participated in non-consumptive activities, and those who participated in both – consumptive and non-consumptive activities. In general, consumptive recreationists are more likely to participate in some form of non-consumptive activity in pursuit of their consumptive activities participation. Hence, in data coding, we treated those respondents who participated in both activities as consumptive recreationists. In the private land ownership module, people who indicated they owned one or more parcels of any type of land (e.g., agricultural land, forestland, wetland, or other open space) in rural areas, i.e., outside town or city limits, including their current residence if it was five or more acres in size, were asked about their participation in conservation easements. In the survey, a total of 710 people reported being landholders. However, because of nonresponse errors and/or missing values in one or more of the covariates, the final sample size used for this study was 352 (NSRE 2005).

Data for community characteristics included gross returns per acre (in US $) collected from the U.S. Department of Agriculture (2002); residency location (urban/rural) collected from the NSRE (2005), distance from a major city (in miles), and median housing value (in US $) collected from U.S. Census Bureau (2003). Table 2

Table 2. Definition of variables

Variables	Descriptions
a. Conservation easements; participated = 1	A binary variable that equals one if respondent participated in conservation easements, and zero otherwise
b. Outdoor recreations participation	
· Land-based consumptive recreations; participated =1	A dummy that equals one if respondent participated in consumptive recreations and both (consumptive and non-consumptive) that was land-based, and zero otherwise
· Water-based consumptive recreations; participated =1	A dummy that equals one if respondent participated in consumptive recreations and both (consumptive and non-consumptive) that was water-based, and zero otherwise
c. Individual characteristics	
· Gender; male =1	A dummy that equals one if respondent was male, and zero otherwise
· Income; income > $50,000	A dummy that equals one if respondent had annual income greater than $50,000 a year, and zero otherwise
· Education; college graduated = 1	A dummy that equal one if respondent had at least college degree, and zero otherwise
· Ethnicity; ethnic minorities = 1	A dummy that equals one if respondent belonged to ethnic minorities, such as African-American, Hispanic, and Asian, and zero otherwise
· Age	Age (in year) of respondent
· Parcel of landholding	Total parcel of land (any category) owned that was greater than 5 acres in rural areas, outside town or city limits
· Area of forest holding	Total area of forest owned
· Year of land tenure	Years of land holding
· Family size	Total number of family
d. Community characteristics	
· Gross returns per acre	Gross Crop revenue (in US $) divided by crop acreage at county level
· Median housing value	Median value (in US $) of specified owner-occupied housing units – one-family houses on less than 10 acres without a business or medical office on the property
· Residency location; urban = 1	A dummy that equals one if respondent belonged to metro area, and zero otherwise
· Distance from major city	Average distance (in mile) to the county from major city
e. Geographic regions (base category = South)	
· Geographic region; Rocky Mountain =1	A dummy that equals one if respondent belonged to Rocky Mountain region, and zero otherwise
· Geographic region; North =1	A dummy that equals one if respondent belonged to Northern region and, zero otherwise
· Geographic region; Pacific =1	A dummy that equals one if respondent belonged to Pacific region and, zero otherwise

Note: Besides three variables – yield per acre, median housing value, and distance from major city, all other variables came from the NSRE (2005). Some respondents were found to participate in both activities. However we treated them as consumptive recreationists, as we adopted a dichotomous classification based on whether or not they are consumptive recreationists.

offers definitions and Table 3 shows summary statistics of the variables used in this analysis. The variables conservation easement participation, activity participation, gender, ethnicity, income, education, residency location, and geographic regions were

Table 3. Descriptive statistics of variables used.

	Total Sample (N=352)			
Variables	**Mean**	**Std. Dev.**	**Min**	**Max**
Conservation easements; participated =1	0.22	0.31	0	1
Land-based consumptive recreations; participated =1	0.59	0.49	0	1
Water-based consumptive recreations; participated =1	0.50	0.50	0	1
Gender; male =1	0.51	0.50	0	1
Ethnicity; ethnic minority = 1	0.06	0.16	0	1
Age	48.58	13.77	18	87
Income; income > $50,000= 1	0.48	0.46	0	1
Education; college graduated =1	0.38	0.48	0	1
Parcel of land holding	4.28	10.66	1	85
Area of forest holding (in acre)	33.30	242.35	0	4500
Years of land tenure	15.09	16.57	1	200
Family size	2.64	1.38	1	7
Gross returns per acre (in $)	26.72	41.55	2.36	540.81
Median housing value (in $ '000)	92.50	41.42	32.7	293
Residency; urban = 1	0.37	0.49	0	1
Distance from major city (in mile)	61.70	54.23	0.44	397.58
Geographic region; Rocky mountain =1	0.11	0.30	0	1
Geographic region; North =1	0.37	0.47	0	1
Geographic region; Pacific =1	0.11	0.30	0	1
Geographic region, South =1	0.41	0.49	0	1

all binary variable. In contrast, age, parcel of land owned, area of forest owned, year of land tenure, family size, gross returns per acre, median housing value, and distance from major city were continuous variable. In the sample, 22% of respondents participated in conservation easement programs. Likewise, 59% of respondents participated in some form of land-based consumptive activities and 50% of respondents participated in some form of water-based consumptive activities over the last 12 months. Similarly, 51% of respondents were male, 6% were ethnic minorities, 48% had income above $50,000 a year, 38% were college graduates, and 37% of respondents were urban resident. Regarding geographic regions, 11% of respondents were from the Rocky Mountain, 37% were from the North, 11% were from the Pacific regions, and 41% of respondents were from the South. Respondents were approximately 49 years old, had 4 parcels of landholding, 33 acres of forest holding, 15 years of land tenure, and had 3 household members on average. Regarding the community characteristics of the place they live, it had gross returns per acre of approximately $27, median housing value of approximately $93 thousand, and was 62 miles away from major city (Table 3).

Results and discussion

Table 4 summarizes our findings. The model was statistically significant, as indicated by Wald chi2. The coefficient for the variable land-based consumptive recreation was negative and statistically significant at the five percent level. The predicted probability of placing land under easement was 0.064 smaller for the individual who participated in land-based consumptive activities compared to those who participated in land-based non-consumptive activities. In contrast, the coefficient for the variable water-based consumptive recreation was positive, but was not statistically significant at a conventional level. This finding suggests individuals who participated in land-based consumptive recreation, such as hunting, are less likely to place their lands in conservation easements than their non-consumptive counterparts. However, this relationship does not hold for water-based consumptive recreation, such as fishing. Hence, outdoor recreationists participating in different types of activities may have different environmental orientations and those environmental orientations may vary between clusters of consumptive activities, such as between hunting and fishing. The potential differences in environmental orientation between fishers and hunters could be due to the character of resource consumption involved, and/or there may be different goal orientations between fishers and hunters. Hunting can be viewed as a resource-intensive activity where harvesting game is the primary goal. The degree of catch consumption associated with fishing has been found to vary, depending upon the values and attitudes of different fishers (Dunlap and Heffernan 1975; Theodori et al. 1998). Further, there is some evidence that some recreational fishers placed less emphasis on catching and removing fish and more emphasis on resource preservation (Bryan 1977).

Despite the finding that land-based consumptive recreationists (e.g., hunters) are less likely than their non-consumptive counterparts to supply lands for easements, conservation movements in the United States have benefited greatly from direct and indirect contributions by hunters. Conservation organizations, such as the Rocky Mountain Elk Foundation, Pheasants Forever, Ducks Unlimited, and Wild Turkey Federation have been supported by contributions from hunters. Many of these organizations raise their primary funds from banquets (e.g., hunting heritage superfund banquets, big game banquets, and other annual banquets), where members and volunteers gather for social purpose while purchasing firearms and other merchandise that are exclusive to banquet attendees. These firearms and other merchandise are subject to the Pittman-Robertson excise tax, which is distributed to state wildlife agencies for research and habitat conservation activities. In some cases, hunters have also supported these organizations in conservation and outreach projects through donations. However, most of the donations or funds are likely to come from non-hunters. According to a recent survey, about 13.7 million Americans hunt (U.S. Fish & Wildlife Service 2014), whereas nearly 90 million people are gun-owners in the United States (Gallup Inc 2013), suggesting that hunters compose a relatively small proportion of all contributors to the Pittman-Robertson Fund. Hunters have also supported wildlife habitat protection through the purchase of Duck Stamps in the United States. The

Table 4. Outdoor recreation participation and conservation easements.

VARIABLES	Coefficients	Marginal effects
Land-based consumptive recreation, participated =1	-0.3968**	-0.0642**
	(0.2097)	(0.0341)
Water-based consumptive recreation, participated =1	0.2935	0.0474
	(0.2214)	(0.0356)
Gender, male =1	0.4631**	0.0750**
	(0.2025)	(0.0324)
Ethnicity, nonwhites =1	0.0980	0.0158
	(0.4678)	(0.0756)
Ln(age)	-13.7558***	0.0130
	(5.2154)	(0.0723)
Ln(age) square	1.8160***	
	(0.7040)	
Income, income > $50, 000=1	0.3708*	0.0599*
	(0.2229)	(0.0354)
Education, college graduate=1	0.0964	0.0156
	(0.2015)	(0.0326)
Residency location, urban =1	-0.2906	-0.0469
	(0.2270)	(0.0370)
Family size	0.0460	0.0073
	(0.0790)	(0.0128)
Area of forest owned	-0.0000	-0.0000
	(0.0000)	(0.0000)
Parcel of land owned	0.0152*	0.0024*
	(0.0088)	(0.0012)
Year of land tenure	-0.0042	-0.0006
	(0.0075)	(0.0010)
Gross returns per acre	0.0044**	0.0007*
	(0.0022)	(0.0003)
Ln(median housing value)	-0.5906*	-0.0955*
	(0.3675)	(0.0597)
Ln(distance from major city)	0.0841	0.0136
	(0.1219)	(0.0195)
Geographic region; Rocky Mountain =1	-0.2051	-0.0332
	(0.4099)	(0.0659)
Geographic region; North =1	0.5986**	0.0968**
	(0.2347)	(0.0384)
Geographic region; Pacific =1	0.8501**	0.1377**
	(0.3939)	(0.0642)
Constant	29.9630***	
	(9.7270)	

VARIABLES	Coefficients	Marginal effects
Log likelihood	-101.80	
Wald chi2	35.55	
Prob>chi2	0.012	
Pseudo R2	0.148	
Observations	352	

Note: Robust standard errors are shown in parentheses. ***, **, and * represent results significant at the a = 0.01, 0.05, and 0.1 levels, respectively. The results are robust with the use of logit and tobit models. Note that dependent variable is *acre of land designated to conservation easement* in the tobit model. The results still hold without the use of log transformed age, median housing value, and distance from major city in the probit, logit and tobit models (results not shown here, but available upon requests).

Duck Stamps are adhesive stamp required by the United States government for hunting migratory waterfowl (please visit http://www.fws.gov/duckstamps/Info/Stamps/stampinfo.htm to know more about the Duck Stamps.). Funds from the Duck Stamp are used to purchase and maintain waterfowl habitat and hunting areas through land acquisition and easements. However, a very small proportion of land (about 3%) in the National Wildlife Refuge System was purchased with funds from the Duck Stamp (U.S. Fish & Wildlife Service 2012). Hence, overall, contributions of hunters for environmental conservation and habitat protection are relatively small compared to the non-hunting population. Thus, it is reasonable to argue that consumptive recreationists are less likely to support environmental conservation compared to their non-consumptive counterparts.

Contrary to previous findings that females are more pro-environmental than males regarding a number of environmental issues (Wolkomir et al. 1997; Zelezny et al. 2000), this study found males to be more likely to place their lands in conservation easements than females. The predicted probability of placing land under easement was 0.075 greater for males than for females. This finding may reflect a male dominated land ownership pattern (forest and non-forest lands) in the United States (Butler 2008). Since placing lands under easements is a way to control land use in the future, males in traditional households often are in the role of making major decisions regarding uses of property. Further, placing lands under easements may represent a different type of environmental behavior than was considered in previous studies, such as reading environmental magazines, using recyclable grocery bags or voting for candidates with pro-environmental agendas (e.g., Baldassare and Katz 1992; Wolkomir et al. 1997; Zelezny et al. 2000). Decisions regarding the uses of household property or assets could have relatively longer-term impacts on household resource allocations, while reading environmental literature or using recyclable grocery bags is less likely to have such a lasting impact on household resources.

Consistent with environmental values and awareness literature, income was positively significant suggesting that individuals with higher income are more likely to participate in conservation easements. The predicted probability of placing land under ease-

ment was 0.059 greater for individuals with annual income greater than $50,000 than those whose annual income was less than $50,000. Also, there was a nonlinear relationship between age and the probability of placing lands under easements. As one might expect, the probability of placing lands under easements decreases at an increasing rate as people get older. This finding is consistent with the environmental value or awareness literature (Van Liere and Dunlap 1980). However, the marginal effect of age was not statistically significant at a conventional level. As per conservation easement literature, the findings show having a larger number of parcels of land is positively associated with the probability of placing lands under easements. The marginal effects suggest one additional increase in parcel of landholding increases the predicted probability of placing land under easement by 0.002 although the parcel sizes could vary across landholders.

As per conservation easement literature, the variable gross returns per acre and median housing value are significant, implying that land with higher yield is more likely to be placed under easement and land with higher property price is less likely to be placed under easement. A $100 increase in gross returns per acre increases the predicted probability of placing land under easement by 0.072. In contrast, a one percent increase in housing value decreases the predicted probability of placing land under easement by 0.095. This result most likely reflects a higher opportunity cost of placing lands in easements in counties where land prices are higher. Regarding the geographic regions, the dummies for North and Pacific regions were positively significant, suggesting that individuals in these regions were more likely to place their lands in easements, compared to the South. The predicted probability of placing land under easement was 0.096 greater for individuals in the Northern states and was 0.137 greater for individuals in the Pacific states, compared to the Southern states. This difference may be because of a greater availability of land resources and also land trust organizations in the Pacific and Northern regions, compared to the Southern region (Land Trust Alliance 2014). The variables ethnicity, education, years of land tenure, residency location, family size, area of forest owned, and distance from a major city were not significant in helping to explain the probability of placing lands under an easement.

Conclusion

Consistent with literature and the notion that consumptive recreationists may differ in their sensitivity to environmental issues, this study found empirical evidence to support that land-based consumptive recreationists are less likely than their non-consumptive counterparts to place their land under easements. This finding could be interpreted to suggest that consumptive recreationists, in general, seem less likely to contribute resources for the general environmental or public good purposes, such as restricting the use of land, or the disposition of natural resources on the land compared to their non-consumptive counterparts.

Since this study concerns outdoor recreation participation of the general population and their decisions regarding placement of their lands under easements in the United

States, findings of this study should be taken within that context. These results may not be generalizable to all landowners, who may have different environmental orientations and outdoor recreation activity preferences. We recommend that future studies of conservation easement participation should account for the potential link between landowners' outdoor recreation and their decision regarding easements. Additionally, econometric analyses used in this study evaluate the intention/behavior of a group in general, but may fail to reveal the underlying variations in attitudes/behavior among sub-segments therein. Hence, the results may not be generalizable to specific individuals.

Despite these limitations, the factors identified by this study could be useful to help further understand factors affecting landowners' decisions to place their lands into an easement, particularly the finding that the type of outdoor recreation they participate in can be directly related to their participation in conservation easements. Findings of this study can also be useful for local governments, or land trusts in designing and implementing their easement programs.

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